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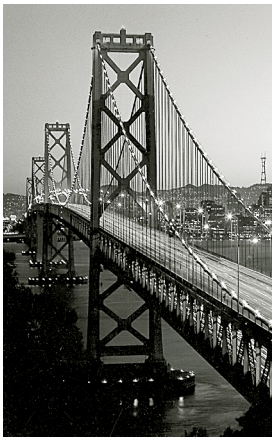


PERFORMANCE MEASURES REPORT FOR THE 2001 REGIONAL TRANSPORTATION PLAN FOR THE SAN FRANCISCO BAY AREA

APPENDIX B
DETAILED METHODOLOGIES FOR PERFORMANCE MEASURES

AND

APPENDIX C
PERFORMANCE MEASURES WORKING GROUP MEETING SUMMARIES

AUGUST 2001

Performance Measures Report
for the
2001 Regional Transportation Plan

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August 2001

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Appendix B

Detailed Methodologies for Performance Measures

Overview of MTC Travel Forecasts

The 2001 RTP performance measures are based on forecasts of year 2025 demographics and travel. The MTC modeling system, described briefly below, was used to generate separate travel forecasts for each of the five RTP EIR alternatives: Proposed Project, No Project, System Management and Operations, Blueprint 1, and Blueprint 2. Forecasts results were then used to calculate the performance measures for each alternative based on the more detailed methodologies described in this chapter.

Demographic forecasts (population and employment) for 2025 are extrapolated from ABAG projections for 2020 as published in Projections 2000. The underlying demographic and land use assumptions are the same for all of the RTP alternatives. Bay Area population and employment forecasts are allocated to 1099 regional travel analysis zones based on 1990 census geography (tracts, block groups, blocks) for travel demand forecasting. This allows us to forecast travel from one travel analysis zone (or "neighborhood") to another. External gateways to the nine-county Bay Area are represented by 21 additional zones.

Travel forecasts are based on demand and supply-side models. Demand side travel models predict traveler behavior, such as trip frequency choice, trip destination choice, mode choice and time-of-day choice, given demographic factors and transportation network characteristics. Typically, travel demand models are based on a four-step process: trip generation (how much travel?), trip distribution (where do people travel?), mode choice (what mode of travel – transit, highway, bicycle, or walk?), and trip assignment (which road/highway or transit route?) MTC employs three additional steps: time of day models (when do people travel during the day?), auto ownership models (how many cars does a household own?), and working household models (how many workers does a household have?). Demand-side forecasts for 2025 are generated by MTC's BAYCAST-90 model. Detailed information on MTC's BAYCAST model and RTP forecasting assumptions are is available on the MTC website at <http://www.mtc.ca.gov/datamart/forecast.htm>.

Supply side travel models include representations of the 1099 travel analysis zones and transportation networks (transit, highway, and nonmotorized) and the methodologies that determine the best paths for a given origin and destination. Supply side forecasts for 2025 are generated by MTC staff using the network planning software package TP+. The future network representations are based on information provided by project sponsors. Forecasts are generated for the 2-hour AM peak period; these forecasts may then be converted into daily estimates using calibrated "peaking factors".

Due to the way the models forecast non-motorized trips, we do not expect significant changes in the number of walk or bicycle trips based on the various RTP investment alternatives. The models base forecasts of walk and bicycle trips based primarily on proximity of origin and destination and traveler characteristics rather than on the existence of bicycle paths or sidewalks. For example, survey data shows that men are more likely to bike and women are more likely to walk. In addition, certain communities such as Palo Alto have high levels of bicycle usage.

Detailed Methodology

B-1 RTP GOAL: MOBILITY OF PEOPLE AND FREIGHT

Measure 1: Aggregate Travel Time and Travel Time Distribution

Daily aggregate (person/vehicle hours), mean (minutes), median (minutes), and 90th percentile (minutes) travel times by primary travel mode for work, non-work, and truck trips. All statistics are reported at the regional level.

Aggregate travel time and average travel time are also calculated for the 15 RTP travel corridor travel corridors. These travel times estimates provides a more focused geographic picture of how investments affect travel in corridors where major transportation improvements are being considered.

Methodology

Standard model outputs include aggregate travel time, travel time frequency distribution, and person trips by mode and trip type. Travel forecasts are generated for six trip types: home-based-work, non-home-base work, shopping, social/recreation, school, and commercial (truck). For the purposes of this measure, home-based work trips are summed and reported as work trips. Shopping, social/recreation, non-home-based, and school trips are summed and reported as non-work trips.

Statistics are calculated based on the primary mode of travel. Thus, if a trip consists of walking from home to a bus stop, waiting for the bus, riding the bus, and walking from the bus stop to the destination, the entire travel time from home to the destination is reported under transit. For work trips, modes include: drive alone, carpool, transit, walk and bicycle. For non-work trips, the auto driver, auto passenger, drive alone, and carpool trips are combined and reported as simply as auto trips.

This measure is reported at the regional and corridor level. The 2001 RTP defines 15 travel corridors. Trips are assigned to corridors based on origins and destinations. For example, a trip between San Francisco and San Jose is assigned to the Peninsula corridor. This may lead to double counting of trips that span two or more corridors.

At the regional and corridor level, aggregate travel time statistics are divided by person trip statistics to generate mean travel time statistics. At the regional level, median and 90th percentile travel time statistics are interpolated from the frequency distribution. Given the complexity and overlap in the corridor analysis, median and 90th percentile travel time values were not calculated.

Measure 2: Travel Time between Select Origins and Destinations

AM peak period travel times between selected origin - destination pairs (minutes) by primary travel mode for drive alone, carpool, transit, and trucks.

Methodology

Representative origin and destination zone (O-D) pairs in each corridor were selected for passenger and truck travel. O-D pairs were selected to highlight the impacts of major investments and to include ports, airports and major job sites.

TP+ identifies minimum-time paths for drive alone, carpool and transit for every combination of the 1099 travel analysis zones and calculates the total zone-to-zone (or door-to-door) travel time for each mode based on these paths. MTC staff have created TP+ software routines to report the total zone-to-zone travel times for the selected O-D pairs by primary travel mode. The total zone-to-zone travel time for a transit trip typically includes a walk or drive element to access the transit stop, a wait element representing the time the passenger spends waiting for the transit vehicle (or vehicles, if the trip requires a transfer) to arrive, and a walk element to access the destination from the transit stop. The zone-to-zone travel time for drive alone or carpool trip typically involves a terminal time to walk to the vehicle, the time spent in the vehicle driving to the destination, and a terminal time to walk from the vehicle to the destination.

For a given O-D pair, truck travel times are assumed to be the same as drive alone travel times because trucks are most likely to use mixed flow facilities, as opposed to carpool facilities. Truck travel times are addressed by focusing on selected O-D pairs significant for truck movements; these are reported in a separate table.

Measure 3: Accessibility to Jobs and Shopping

Average percent of all regional jobs and retail jobs within X minutes of home: X = 15, 30, 45 minutes for auto and transit; X = 15, 30 minutes for walk and bike.

Methodology

The measure is a weighted average of the number of jobs accessible from each travel analysis zone. Forecasts of 2025 employment locations including retail employment, a proxy for shopping opportunities, are based on ABAG projections.

MTC staff have developed a program that tallies the number of jobs in all zones within a specified travel time contour (or "isochron") by mode from each of the 1099 zones. The regional total value is the average number of accessible jobs from all 1099 zones, weighted by the number of households in all 1099 zones. The calculation is expressed by the equation on the next page.

$$J_k^{\,t} = \frac{\sum J_{ik}^{\,t} H_i}{\sum H_i}$$

Where:

$J_k^{\,t}$ = Average number of jobs accessible by mode k within the travel time t contour for the entire region; k= auto, transit, walk, bicycle; t= 15, 30, 45 minutes.

$J_{ik}^{\,t}$ = Number of jobs accessible by mode k within the travel time contour t from zone i; i=1 to 1099; t=15, 30, 45 minutes.

H_i = Number of households in zone i; i=1 to 1099.

The resulting value is a single number for the region, that represents the average number of jobs accessible per household. This number is then divided by the total number of regional jobs to calculate the percent.

The time dimension of this measure recognizes that people desire different levels of accessibility for different kinds of shopping. People typically wish to make relatively short trips for regular shopping such as groceries, yet are willing to make longer trips for less frequent purchases such as cars, appliances, and furniture. Though differentiating among types of retail is beyond the level of detail of the regional travel model, the 15-minute and 45=minute isochrons reflect the importance of both types of trips.

B-2 ECONOMIC VITALITY

Measure 4: Access of Employers to the Region's Work Force

Number of employed residents within X minutes by mode of major job centers: X = 15, 30, 45 minutes for auto and transit; X = 15, 30 minutes for walk and bike.

Methodology

Eighteen (18) representative job centers were identified throughout the region. These are listed in Table 1. The number of employed residents accessible to the zone in which the job center is located is then calculated for each job center. MTC staff developed a TP+ program to identify all zones within the specified travel time contour of the job-center zone. The employed residents within those zones are then summed together to generate the number of regional workers with access to that job site. The number can also be reported as the share of the region's workforce accessible to each job site.

Table 1: Job Centers Used In Economic Vitality Measure

San Francisco Financial District	Oakland - Central Business District
San Francisco- Mission Bay area	Concord
San Francisco International Airport	San Ramon - Bishop Ranch
Redwood City	Vallejo – Central Business District
Sunnyvale	Napa Airport Area
San Jose Central Business District	Petaluma - Central Business District
Milpitas	Santa Rosa - Central Business District
Pleasanton - Hacienda Business Park	Novato – Central Business District
Hayward - Downtown area	San Rafael - Central Business District

Note that this measure must be reported for each work site since summing the totals for all worksites would double count some workers. At the same time, when we consider results for individual zones we sometimes results that may not be representative of what is actually happening. For example accessibility to one zone may decrease from the No Project to the Project while accessibility to an adjacent zone may stay constant or increase. The true accessibility to the job center located in portions of both zones may not decrease at all, yet if we have chosen to report the first zone, it will appear to decrease. This occurred for the San Francisco Financial District in our analysis. Sometimes this is due to a service improvement that serves one zone directly and forces a new transfer to an adjacent zone.

Measure 5: Economic Efficiency – Net Benefit and Benefit Cost Ratio

Net Benefit = _ [annual user costs] – _ [annualized public expenditures]
Benefit Cost Ratio = _ [annual user costs] / _ [annualized public expenditures]

Where:
User costs = out-of-pocket user + costs travel time costs
Public expenditures = capital and operating expenditures

Methodology

User Costs[1]

Changes in user costs are computed for year 2025 relative to the No Project Alternative. This is essentially a "consumer surplus" factor based on changes in travel time costs and out-of-pocket user costs. Out-of-pocket user costs include transit fares, auto operating costs, parking costs, and tolls.

Figure 1 illustrates the consumer surplus concept for transit, though it applies to all modes. The line D-D is the transit demand curve. P_0 and U_0 represent the generalized price of travel (travel time costs plus out-of-pocket costs) and the forecasted number of transit users in the No Project Alternative. P_1 and U_1 represent the generalized price and number of forecasted users in an alternative with transit enhancements. The new price P_1 results from travel time savings offered by the enhancements and may also reflect changes (positive or negative) in transit fares. Consumer surplus is composed of benefits to existing and new users. The benefits to existing users is represented by the area in square A. The benefits to new users is represented by the area in triangle B. Together areas A and B represent the total value of the benefits to all users.

The following steps are used to estimate the change in user costs:

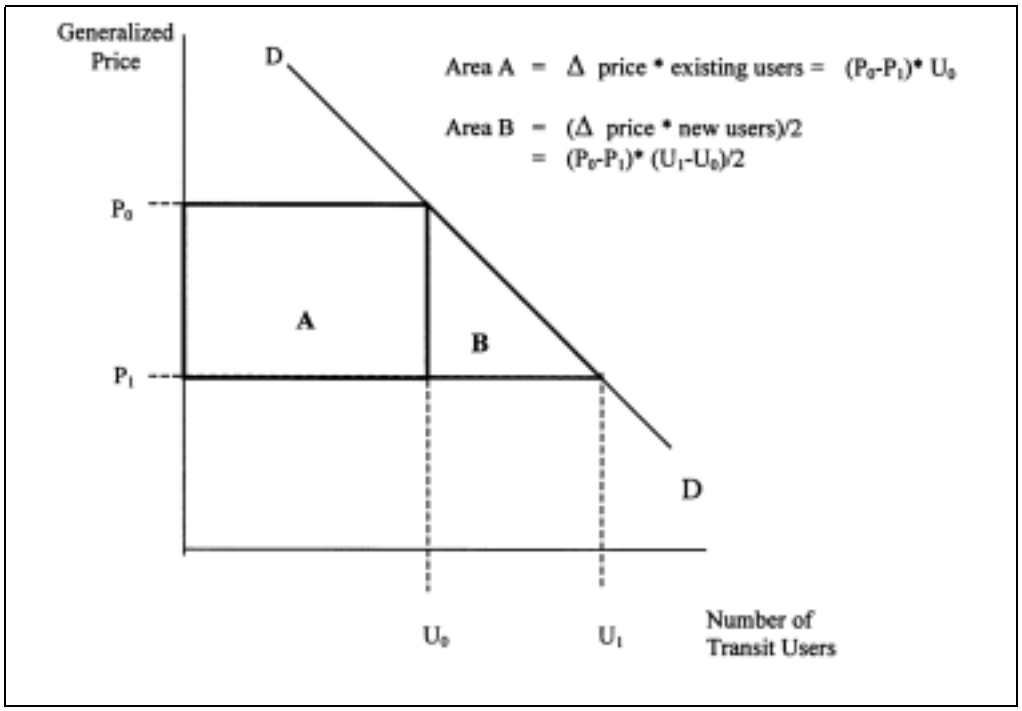
1. **Calculate the change in the number of trips** for each mode (auto, transit, bike, and walk) from travel demand forecasts for the No Project and other alternative.

2. **Estimate daily travel time savings** for existing and new users for each mode. For transit and auto, report in-vehicle and out-of-vehicle travel time separately.[2] A TP+ algorithm compares zone-to-zone travel times for the alternatives for each mode, calculates the savings, and then multiplies the travel time savings by the number of users of each mode. The algorithm is straightforward except when two zones are connected by transit in one alternative but not the other. In this case, the

[1] This section draws heavily from Appendix C in FTA's Technical Guidance on Section 5309 New Starts Criteria (September 1997). This report is currently being updated but the new version of this section was not available at the time of this writing.
[2] In-vehicle travel time is the time spent in the car or transit vehicle. Out-of-vehicle travel time is the time spent walking to the car or transit stop and, in the case of transit, the time spent waiting for the transit vehicle to arrive include time spent waiting to transfer from one route to another. In practice, the out-of-vehicle travel time for a trip by auto between any two zones will not change from one alternative to another; as a result, the change between the two alternatives will always be zero.

alternative in which the zones are connected is assumed to have a 15 minute travel time advantage.

Figure 1: User Benefits



3. **Monetize the travel time savings** by applying the appropriate values of travel time to the travel time savings for existing and new users using the formulae shown in Figure 1. Economic theory bases the value of travel time on opportunity cost, that is activities preferred by people or their employers if they were not traveling. The value of travel time is revealed by the choices people make, though it does not carry an explicit price tag. The analysis of user benefits uses the values of time shown in Table 2. These values are based on three simplifying assumptions:

    - A single value of time is used for in-vehicle travel. This value is assumed to the average post wage rate, which is approximately 75% of the average wage rate ($22.71 per hour) This value is based on home-based-work trips, though economic theory holds that the value of travel time for non-work trips is lower by approximately 50%. This simplification allows a more straightforward calculation of travel time savings instead of calculating savings for each trip type separately. It is likely that approximately 70% of the value of travel time savings in this analysis is attributable to work trips.

    - A single value for out-of-vehicle travel time is used though economic theory holds that the access component is valued differently than the wait

component. The value used in this analysis is roughly 2.2 times the value of in-vehicle travel time. This relationship is based on the relationship of the estimated values of in-vehicle and out-of-vehicle travel time in the regional travel demand model.

- The value of truck travel time includes truck driver wages as well as overhead costs borne by the carrier. The $80 value is based on an economic analysis conducted in Seattle in 1996.

Table 2: Values of Travel Time

Trip Type	*(2001$ per hour)*
Auto person trips – in-vehicle	$ 17.03
Transit person trips – in-vehicle	$ 17.03
Auto/transit trips – out-of-vehicle	$ 37.50
Bicycle trips	$ 17.03
Walk trips	$ 17.03
Truck trips (freight)	$ 80.00

4. **Estimate the change in daily out-of-pocket user costs** by comparing the zone-to-zone user costs for each mode. As with the estimation of travel time savings, this step uses a TP+ algorithm. The TP+ calculations are based on 1990 dollars because the model is calibrated to 1990. As a result, the estimates are adjusted to 2001 dollars based on the ration of the Bay Area CPIs for 1990 and April 2001 (581.3/247.0). If two zones are connected by transit in one alternative and not in the other, a $6.33 advantage ($2.50 in 1990$) is assumed for the alternative in which they are connected. The changes in costs are then multiplied by the number of users by mode.

5. **Annualize the change in user costs.** The estimates of travel time cost and out-of-pocket costs are based estimates of daily trips. The estimates are annualized by multiplying by 300.

Public Expenditures

For this analysis, public expenditures were calculated for the RTP Project Alternative only because limited information on project costs for the other alternatives prohibited further calculations. The following steps are used to calculate the public expenditure for the RTP Project Alternative:

1. **Identify those projects in Track 1 (beyond the Committed projects included in the No Project Alternative) that impact travel time in the travel forecasts.** Because the benefits calculation relies only on travel time savings estimated by the travel demand models, the calculation of public expenditures accounts for only those projects that impact travel time in the travel forecasts. For the most part, this means transit service expansion, arterial, and highway expansion including auxiliary and carpool lanes, interchange improvements, and major

arterial signal interconnect and timing projects. The following types of projects are not included because they do not impact travel time forecasts: transit and roadway rehabilitation, regional customer service programs, planning funds, bike and pedestrian enhancements, safety enhancements, intermodal facilities, and expanded parking for transit stations.

2. **Calculate the annualized capital expenditure in RTP funds for the alternative.** The annualized capital expenditure of a project is the total expenditure cost discounted over the expected lifecycle of the project. Table 3 shows assumptions about the lifecycles of various project types. The measure was calculated using a 4% and a 7% discount rate. The annualized capital expenditures for all projects are summed to get the total RTP Track 1 capital expenditure.

Table 3: Assumed Life Cycles

Improvement	***Life Cycle (years)***
Bus systems	12
Ferry systems (vessels and facilities)	20
Rail systems (vehicles, tracks, stations)	30
New roadway (freeway, arterials, interchanges)*	20
Arterial smart corridors (ITS and signal improvements)	12

3. **Calculate annual operating and maintenance expenditures.** This analysis relied on different methodologies for transit and roadways. For transit expansion projects, the analysis uses net annual operating costs provided by project sponsors. This information was not available for roadway expansion projects. Thus, incremental operating and maintenance costs were estimated by applying a unit cost for pavement maintenance to the lane miles of new roadway in the Project alternative, as represented in the TP+ 2025 Project highway network. This analysis assumed an annual O&M cost for roadways of $11,000 based on the estimated annual O&M cost for the Caltrans District 4 2002 STIP submittal. The annual operating and maintenance costs for all the projects are added to get the total cost for the Project Alternative.

B-3 COMMUNITY VITALITY

Measure 6: Transit Oriented Development - Population and Employment within Walking Distance (1/2 Mile) of Major Intermodal/Rail Stations.

Number of regional population and employment within _ mile of rail stations and major intermodal transit centers

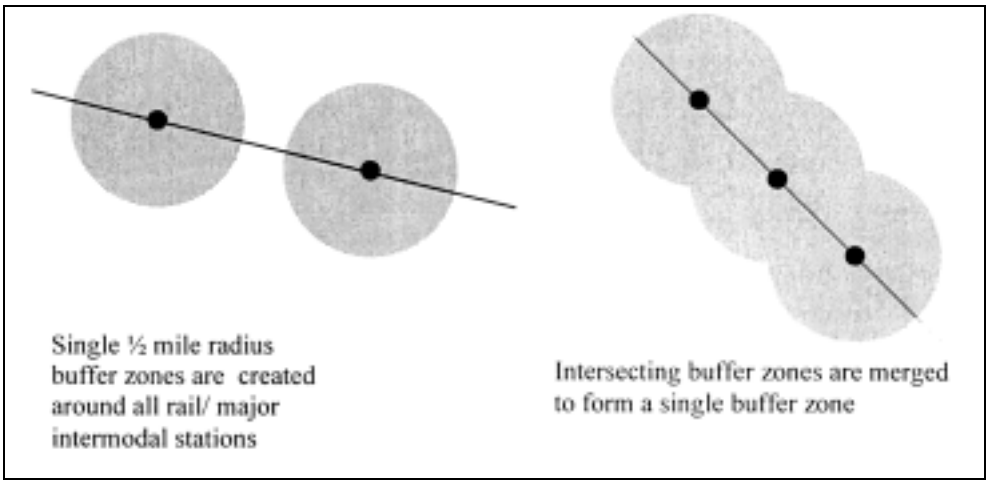
Methodology

We assume that transit oriented development efforts are focused within _ mile of major intermodal and rail stations. At an average rate of 3 miles per hour, walking _ mile would take 20 minutes; this is a reasonable threshold for establishing "walkability" for a regional analysis and is consistent with assumptions in the MTC travel demand model. This analysis includes all rail stations, light rail stops, ferry terminals, and major bus transfer centers with express bus service (such as the Transbay Terminal, San Rafael Transit Center, and Vallejo Transit Center).

This analysis uses MTC's Arcview GIS system to generate estimates of population and employment around each station. The general methodology follows below:

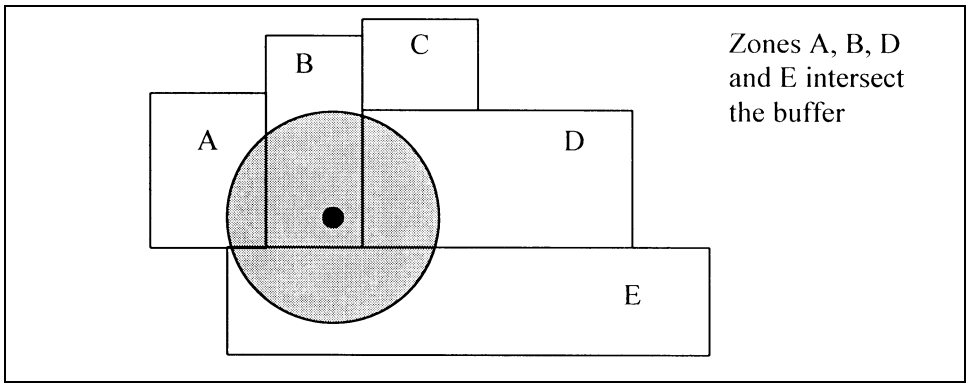
1. **Generate estimates for 2025** based on population and employment forecasts for travel analysis zones.
    - Calculate the average population employment densities for each zone in 2025, assuming even distributions of population and employment within each zone. In general we assume population and employment are evenly distributed within each travel analysis zone, and density is based on the total acreage of the zone. In a few cases where a travel analysis zone contains a large proportion of undeveloped land, density is calculated based on only the developed acreage in the zone.
    - Locate each of the transit stops to be included in this analysis. For this exercise, we converted the TP+ transit network for each alternative to GIS shape files. This is more expedient, though possibly less accurate, than geocoding each station individually.
    - Draw a _ mile radius circle, or "buffer" around each identified major intermodal/rail station in Arcview. Where one buffer intersects another, they are merged to form a single buffer for a group of stations. (See Figure 2.) This step, which is necessary to avoid double counting, is required primarily in San Francisco (where BART and Caltrain stations and the Transbay terminal are close together and along the Muni Metro light rail lines), downtown Oakland (where BART and Amtrak stations are close together), and in Santa Clara (along the VTA light rail lines).

Figure 2: Buffers for TOD Analysis



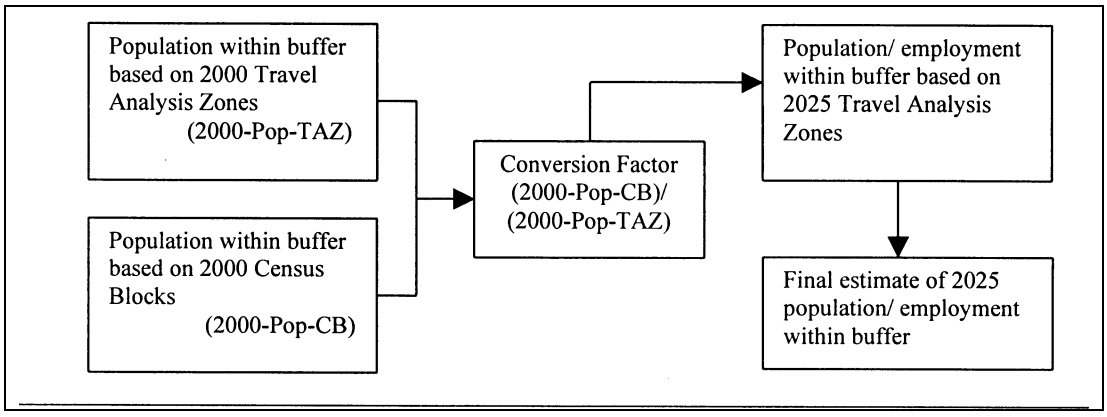
- For each buffer, identify the travel analysis zones that intersect the buffer; calculate area of intersection (See Figure 3.) for each zone and multiply it by the population and employment densities for that zone. The resulting product are estimates of 2025 population and employment for each buffer based on forecasts at the zone-level.

Figure 3: Intersection of Travel Analysis Zones with Buffer



2. **Calculate adjustment factors** based on 2000 population data. In most cases, census blocks are smaller than travel analysis zones and are a better basis for estimating population within the buffers. Census block level data is available for 2000 population only. Thus, we generate conversion factors for each buffer equal to the ratio of population within the buffer based on 2000 census blocks and 2000 travel analysis zones. This method is shown in Figure 4. The population adjustment factor is applied to the 2025 population and employment estimates generated in Step 1.

Figure 4: Calculate Adjustment Factor



3. **Add the adjusted estimates to get totals by county and for the entire region.** This analysis is best suited for reporting at the regional or county level due to the large number of assumptions and a low level of precision in the station locations. Reporting population and employment for individual stations or station groups would imply a level of accuracy higher than that characterizing this analysis.

Measure 7: Transit Trips with Walk Access

Methodology

Standard TP+ outputs include the number of trips for which transit is the primary mode and the number of transit trips with walk access (as opposed to drive access).

B-4 THE ENVIRONMENT

Measure 8: Air Quality and Global Warming –Vehicle emissions

Regulated pollutants (tons per day) –	Reactive Organic Gases (ROG) Nitrogen Oxide (NOx)
Unregulated pollutants (tons per day) –	Particulates (PM_{10}) from entrained road dust Carbon Dioxide (CO_2), surrogate for global warming

Methodology

Estimates of ROG, NOx and PM_{10} are developed at by applying the latest available vehicle emissions factors to MTC's travel demand forecasts for 2025 the regional level. Forecasts of vehicle miles traveled, vehicle trips, and average vehicle speeds are the major demand factors that affect emissions forecasts. MTC staff use the California Air Resources Board model EMFAC 7G/BURDEN 7G to estimate regional vehicular emissions.

B-5 EQUITY

The performance measures for this goal are drawn from one component of the 2001 RTP Equity Analysis which was developed by MTC in consultation with the Environmental Justice Advisory Group. Consistent with federal Environmental Justice guidance, the Equity Analysis assesses whether the RTP results in disparate negative impacts on low-income or minority communities.

The basis of the equity analysis is a comparison of target communities to the rest of the Bay Area according to three measures of mobility. The target communities are minority or low-income communities as defined by federal guidance. According to the guidance, minority refers to as African American, Asian America, Hispanic, and Native American. Data from the 2000 Census is used to identify minority communities. The Bay Area is approximately 50% minority. To focus the analysis on communities with concentrations of minority residents, travel analysis zones are included in the analysis if the combined minority population exceeds 70% of the total population in the zone.

Low-income is defined in federal guidance as having a household income at or below the US Department of Health and Human Services Poverty Guidelines. Due to the high cost of living in the Bay Area, this analysis uses a higher threshold, 200% of poverty. Because 2000 Census data on income is not yet available, this analysis uses 1990 Census data. Travel analysis zones are included in the analysis if 30% or more of the population is low-income.

A total of 333 travel analysis zones qualify under these definitions: 99 zones qualify as low-income, 98 as minority, and 136 as both minority and low-income. These zones can be grouped into 43 target communities based on geographic proximity.

Measure 9: Aggregate Travel Time and Travel Time Distribution for Low-Income and Minority Communities

Aggregate (person/vehicle hours), mean (minutes), median (minutes), and 90th percentile (minutes) travel times by primary travel mode for work and non-work trips for low-income and minority communities compared to the rest of the Bay Area.

Methodology

The general methodology is the same as in Measure 1. To assess whether the RTP has negative, disparate impacts on the target communities, the measure is calculated for minority communities, non-minority communities, low-income communities, non-low-income communities. Communities that are both low-income and minority according to the definition are included in both calculations.

Measure 10: Accessibility to Jobs from Low-Income and Minority Communities

Average percent of all regional jobs and retail jobs within X minutes of home for low-income and minority communities compared to the rest of the Bay Area: X = 15, 30, 45 minutes for auto and transit; X = 15, 30 minutes for walk and bike.

Methodology

The general methodology is the same as in Measure 3. To assess whether the RTP has negative, disparate impacts on the target communities, the measure is calculated for minority communities, non-minority communities, low-income communities, non-low-income communities. Communities that are both low-income and minority according to the definition are included in both calculations.

Measure 11: Transit Travel Time from Low-Income and Minority Communities to Major Job Centers

AM peak period transit travel times for selected pairs of target communities and major job centers.

Methodology

122 selected origin destination pairs are identified based on the 42 target communities (origins) and the 18 major job centers identified in Measure 4 (destinations).

TP+ identifies minimum-time paths for drive alone, carpool and transit for every combination of the 1099 travel analysis zones and calculates the total zone-to-zone (or door-to-door) travel time for each mode based on these paths. MTC staff have created TP+ software routines to report the total zone-to-zone travel times for the selected O-D pairs for all trips involving transit. The total zone-to-zone travel time for a transit trip typically includes a walk or drive element to access the transit stop, a wait element representing the time the passenger spends waiting for the transit vehicle (or vehicles, if the trip requires a transfer) to arrive, and a walk element to access the destination from the transit stop.

Appendix C

Performance Measures Working Group Meeting Summaries

MTC PERFORMANCE MEASURES WORKING GROUP
JANUARY 25, 2001
MEETING SUMMARY

ATTENDANCE

See attached list.

1. INTRODUCTIONS AND WELCOME

After introductions, Lisa Klein and Therese McMillan thanked everyone for participating. Therese acknowledged the challenges before this group. She encouraged the group to set realistic expectations for this RTP and view it as a first step.

Comments/Questions/MTC Staff Response

John Holtzclaw asked whether MTC intended to use performance measures in future RTPs or to pursue project evaluation. He suggested we might see marginal differences between investment packages and project evaluation might reveal bigger differences. Stan Randolph remarked that we will not have time to develop project evaluation measures. Chris Brittle responded that MTC intends to look at a range of alternatives, including land use and pricing, in this and future RTPs. A great deal of project analysis, such as corridor studies, environmental studies, the Blueprint Evaluation, is considered in developing the RTP. Therese McMillan added that the five RTP goals are not always mutually supportive, especially in project level evaluation. For example, a life-line transit route that provide essential access may rank low in cost effectiveness. Investment packages would contain projects that serve different goals well.

2. BACKGROUND ON PERFORMANCE MEASURES AND RTP UPDATE

Lisa Klein stated that much of MTC s past work had been directed at monitoring conditions of the existing transportation system from the customer s perspective; more recently attention has been on applications in the Blueprint and RTP, which require forecasting. Lisa distinguished program level and project level evaluation; the RTP analysis will focus on program evaluation to discern differences among RTP alternatives. The schedule for performance measures for the 2001 RTP is driven by RTP milestones: identifying performance measures and environmental justice (EJ) evaluation measures by the end of March; completing modeling in May; issuing the Draft EIR and performance report in June/July; and adopting the final RTP in October.

Comments/Questions/MTC Staff Response

Tina Konvalinka asked whether we might consider revising or prioritizing the RTP goals. Therese McMillan responded that this would occur in a policy context.

3. OVERVIEW OF ITS (UC BERKELEY) REPORT

Professor Marty Wachs reinforced the importance of monitoring conditions on the existing system and noted that data limitations may force a disconnect between this and what we look at in an RTP forecasting context. He cited the example of safety, for which it is possible to collect good data on existing conditions but for which forecasts are not informative because

they are based on existing accident rates. We should aim to identify outcome oriented measures as opposed to output measures. For example, VMT is an output — rather than outcome — rather than a measure of mobility. In developing the recommended measures in their report, the UC Berkeley team reviewed literature and case studies, formulated a long list of measures, and evaluated them to develop a more manageable list for this group to consider.

Comments/Questions/MTC Staff Response
Michael Cunningham asked whether model accuracy was considered in the evaluation. Professor Wachs responded that it was, and many measures were eliminated because they cannot be forecast at all. Steve Buckley added that we avoided measures that required monetization. Lisa Klein added that we need to view accuracy in terms of comparing alternative forecasts.

Carolyn Gonot remarked that the CMAs use performance measures in their CMPs, yet these are not included in the report. Lisa suggested that CMA staff introduce their measures as appropriate.

Bob Planthold requested that the group revisit the use of VMT and LOS as neither addresses the movement of people. Professor Wachs agreed that this is important but noted it is difficult to get good data on vehicle occupancy.

David Schonbrunn remarked that the report failed to include adequate measures in several categories. He advocated David Jones approach which asks how the system is working. We need more fine-grained measures than congestion. Accessibility and community vitality also were not addressed adequately. Percent of household income spent on transportation should be considered for community vitality. Chris Brittle noted that the group may consider measures of community vitality even though none are recommended in the ITS report.

Jean Hart noted that with the time constraint for this RTP, we need to acknowledge our limitations and look at some things later. Ezra Rapport suggested the group might recommend that MTC revise the RTP goals. Lisa stated that she views the identification of areas for future work to be an important element of the group s work. Therese McMillan added that some goals may not have quantifiable measures. Qualitative analysis is a possibility if it is useful for comparing investment alternatives.

4. WORK GROUP OBJECTIVES AND WORK PLAN

Lisa reiterated the objectives to select measures that allow comparison of investment alternatives in the 2001 RTP update and identify areas for future work. This group will focus on the RTP goals other than equity. The Environmental Justice Working Group (EJAG) will focus on equity during the same time frame, and MTC will provide opportunities for dialog. Work plan milestones include selection of performance measures by the end of March and developing a report in June/July.

Comments/Questions/MTC Staff Response
Jean Hart suggested we spend some time at the next meeting outlining what the group expects to accomplish by March in light of members interests in performance measures.

5. ITEMS FOR FOLLOW-UP

Lisa Klein asked that participants submit comments to her in advance of the next meeting so that we can dive into discussions on the group s expectations as well as specific recommendations for mobility measures. Comments will be due to Lisa on February 2. She will assemble them and distribute them back to the group by February 8.

NEXT MEETING

Two meetings will be held in February:

February 14, 2001	February 27, 2001
3:00 to 5:00 PM	8:30 — 10:30 AM

MTC PERFORMANCE MEASURES WORKING GROUP
ATTENDANCE AT THE JANUARY 25, 2001 MEETING

Name		Representing
Brad	Beck	Contra Costa Transportation Authority
Steve	Beraldo	RIDES
Chris	Brittle	MTC
Mark	Brucker	US EPA (Air 2)
Steve	Buckley	UC Berkeley
Dan	Christians	STA
Melanie	Crotty	MTC
Michael	Cunningham	Bay Area Council
Tom	Goff	California Alliance for Jobs
Carolyn	Gonot	SCVTA
Bill	Gray	William R. Gray and Company
Steve	Gregory	Port of Oakland
Jean	Hart	Alameda County CMA
Pam	Herhold	BART Financial Planning
Henry	Hilken	BAAQMD
John	Holtzclaw	Sierra Club
Dan	Kirshner	Environmental Defense
Lisa	Klein	MTC
Tina	Konvalinka	AC Transit
Mariane	Lee-Skowronek	SFTA
Trent	Lethco	MTC
Noreen	McDonald	
Therese	McMillan	MTC
Gabrielle	Middleton	BART
Bob	Planthold	EDAC
Chuck	Purvis	MTC
Stan	Randolph	California Trucking Assn.
Ezra	Rapport	Senate Select Committee
David	Schonbrunn	TRANDEF
Todd	Vogel	US EPA (Air 2)
Martin	Wachs	ITS, UC Berkeley
Matt	Williams	
Albert	Yee	Caltrans

MTC PERFORMANCE MEASURES WORKING GROUP
FEBRUARY 14, 2001
MEETING SUMMARY

ATTENDANCE —See attached list.

1. BACKGROUND MATERIALS DISTRIBUTED

Per requests by participants, MTC staff distributed the following materials:

(a) Intermodal Performance Measures for the Bay Area Transportation System, Summary Report by David Jones (1995)
(b) RTP Task Force Track 2 Questions (1996)
(c) List of performance measures used in countywide plans (2/14/01).
(d) 2001 RTP Outreach Schedule

2. INTERESTS AND OBJECTIVES

MTC s objective is twofold: (1) to identify performance measures in the next 2 months for use in the 2001 RTP at the same time and (2) to identify efforts that are important to participants but too complex or time consuming to pursue directly in association with the 2001 RTP. These would be pursued following the 2001 RTP. For the 2001 RTP, MTC staff want to focus on measures that link to the RTP goals and decisions outlined in the agenda packet and that are consistent with the evaluation criteria used by ITS. We recognize that project evaluation is of interest to many participants but cannot overpromise to conduct a complete project evaluation for this RTP. MTC suggested that a Blueprint-like project evaluation could be included for a specific set of high interest projects.

Professor Wachs responded to comments he had received that the report addressed performance measures too narrowly. ITS stated that the scope of the ITS study was focused on the immediate RTP process rather than on an ideal system of measures. The report therefore only minimally explores monitoring of existing conditions and of quality of life issues that could be addressed through surveys or other means. The RTP context constrains the types of measures that are meaningful. For example measures of safety are not useful in an RTP forecasting context.

Comments/Questions

- Project evaluation should include a consumer surplus measure based on the value of time.
- The Blueprint analysis of travel time savings is flawed because it does not account for delays due to construction or for induced travel demand.
- At the Lisa Klein s request, participants offered statements of their interests for MTC s use of performance measures. These statements are summarized in Attachment A.

MTC Staff Response

- MTC staff will propose a work plan to address the stated concerns in this RTP and in future work.

3. PERFORMANCE MEASURES FOR THE MOBILITY GOAL

MTC staff distributed a hand out showing the 12 measures recommended in the ITS report as well as the approximately 17 suggestions submitted by participants. In an effort to help

reduce the list to 10 or fewer, MTC grouped the measures in tiers based on feasibility for the RTP, ties to RTP decisions, and the other evaluation criteria from the ITS report.

Comments/Questions

- The table should also show which measures are relevant to other RTP goals.
- The measures focus too much on the movement of vehicles and not enough on the movement of people. Measures of speed and congestion should be collapsed.
- Consumer surplus should be considered to illustrate the value of travel time savings.
- The measures focus too much on the peak period and on motorized modes. Mode split would be a good measure of accessibility.
- As part of the LUTRAC study, Cambridge Systematics published a handbook on how to model pedestrian travel.
- The group agreed that the measures of congestion and delay do not address the very important notion of system reliability. We need to note that this data is not available and that this makes the measures weaker.
- VMT per person trip and VHT per person trip show the relationship of persons and vehicle movement and illustrate access, mobility and system efficiency.
- It is important that the measures reflect notions of transit access and of choice.
- VTA used a measure of transit accessibility reflecting access to opportunities by transit.
- VTA has measured mobility benefits as a function of the number of person trips accommodated in the peak hour.

MTC Staff Response

- MTC model capabilities related to off-peak period, non-work trips, and non-motorized modes could be presented at a future meeting.

4. ITEMS FOR FOLLOW-UP

- CMA staff should submit corrections to the list of measures used in countywide plans.

For the next meeting:

- MTC staff will develop a work plan for the longer term issues.
- MTC staff will prepare a presentation on model capabilities related to off-peak period, non-work trips, and non-motorized modes.
- Lisa Klein will work with Carolyn Gonot to develop 5-minute presentations on VTA s measures of transit accessibility and of person trips in the peak period.
- David Reinke will prepare a 5-minute presentation on consumer surplus.
- Chuck Purvis will prepare a brief presentation on measures of accessibility.

After hearing further input, MTC staff will propose a short list of 10 or fewer measures of mobility for the RTP.

NEXT MEETING

February 27, 2001, 8:30 — 10:30 AM

MTC PERFORMANCE MEASURES WORKING GROUP
ATTENDANCE AT THE FEBRUARY 14, 2001 MEETING

Brad	Beck	Contra Costa Transportation Authority
Steve	Beraldo	Rides for Bay Area Commuters
Chris	Brittle	MTC
Mark	Brucker	US EPA (Air 2)
Steve	Buckley	UC Berkeley
Stuart	Cohen	Transportation Choices Forum
Melanie	Crotty	MTC
Michael	Cunningham	Bay Area Council
Carolyn	Gonot	Santa Clara Valley Transportation Authority
Jean	Hart	Alameda County CMA
Henry	Hilken	Bay Area Air Quality Management District
John	Holtzclaw	Sierra Club
Lisa	Klein	MTC
Tina	Konvalinka	AC Transit
Marian	Lee-Skowronek	San Francisco County Transportation Authority
Trent	Lethco	MTC
Noreen	McDonald	
Dennis	Oliver	California Alliance for Jobs
Chuck	Purvis	MTC
Ezra	Rapport	Senate Select Committee
David	Reinke	BART
David	Schonbrunn	TRANSDEF
Todd	Vogel	US EPA (Air 2)
Martin	Wachs	Institute of Transportation Studies, University of California
Albert	Yee	Caltrans District 4 Hwy Operations

Attachment A
Objectives and Interests
Statements by Participants in the February 14, 2001 Meeting
of the Performance Measures Working Group

Relation to Decision Making

- Improve the quality of analysis and of public discourse
- Illustrate realistic outcomes for decision makers
- Illustrate differences based on existing and future needs; do not shape needs
- Illustrate distinctions among values
- Steer investment decisions to optimize transportation results, equity, and protection of the environment
- Steer decisions to efficient transportation and enhanced livability while minimizing pollution and habitat loss
- Enhance accountability and trust
- Help make efficient use of resources
- Reflect mobility and other RTP goals and reveal deficiencies when county plans are put together
- Recognize conflicts of interest between counties and the region

Goals & Activities for the Working Group and MTC

- Develop consensus for what will be used in this RTP
- Recognize that we may eventually revise measures selected for use in the short term
- Identify a small set of measures to evaluate the relative ability of alternatives to meet the RTP goals using available tools
- Develop standard measures, or at least consistent measures, to evaluate projects and plans and for monitoring.
- Identify enhancements to models and methodologies to enable better measures
- Develop a monitoring system to show trends relative to RTP goals to the public
- Connect monitoring and RTP analysis
- Develop a vision
- Develop (RTP) objectives and use performance measures to help guide investments
- Identify corridor issues and objectives and monitor performance relative to those objectives. Use modeling to show how we will meet the objectives in the future.

Characteristics of Measures

- Measures should incorporate economic valuation
- Individual measures should support multiple goals
- Measures should apply to management of both supply and demand
- Measures should look at access and choice, not just corridor mobility
- We need a variety of measures to reflect the diversity of the Bay Area
- Avoid ambiguous measures

MTC PERFORMANCE MEASURES WORKING GROUP
FEBRUARY 27, 2001
MEETING SUMMARY

ATTENDANCE —See attached list.

1. BACKGROUND MATERIALS DISTRIBUTED

The following materials were provided at the meeting:

From last meeting

- Statements from participants: objectives and interests
- RTP decisions and performance measures table

Follow-up to ongoing discussion

- Continuing work plan
- Notes on issues raised in discussion on mobility
- Relationship between mobility measures and other RTP goals

New

- Draft description of potential RTP EIR alternatives
- Regional transit expansion program draft criteria
- Discussion paper by Sherman Lewis: Performance Measures: Problems of Means and Ends

2. PROCESS FOR NEXT MEETINGS AND CONTINUING WORK PLAN

MTC staff reviewed the objectives for the meeting as well as the topics for the next few meetings. The group will need to meet twice more by early April to develop a recommendation for measures for all the RTP goals, including Mobility, on which we focused to date. Other topics include objectives for the RTP goals, the continuing work plan, and summary of the process and areas of agreement/disagreement for presentation to the Commission. MTC staff presented options for meeting facilitation including the possibility of hiring an outside facilitator for the next two meetings.

Staff welcome suggestions for desired model and analysis capabilities (improvements) and refinements to the RTP performance measures on an ongoing basis. Suggestions requiring significant model improvements would be forwarded for consideration by the existing Model Coordination Task Force.

Phase 1 of the work on performance measures would take us through the end of March and the recommendation to the Commission of measures for the 2001 RTP. Phase 2 work elements for the group include: (1) Review of the 2001 RTP Performance Report; (2) Refinements to the 2001 RTP performance measures for the future; and (3) Development of a monitoring program.

Comments/Questions	MTC Staff Response
• It would be helpful to have an outside facilitator and is important that we find someone skilled an knowledgeable on this topic. This may be difficult on such short notice.	• MTC staff will try to find a skilled facilitator.

Comments/Questions	MTC Staff Response
• It will be important to summarize all the discussion meaningfully for other people and decision makers	• MTC staff will prepare a summary of the process, the discussion and areas of agreement/ disagreement for presentation to the Commission with the recommendation.

3. RTP DECISIONS AND ALTERNATIVES

As context for the group s work, MTC staff gave an overview of nine key RTP decisions and the 4 proposed alternatives for the RTP EIR. Staff encouraged the group to keep them in mind as we will look to the measures to help inform these decision. Three of the four proposed RTP alternatives are financially constrained; the 4th (Blueprint Alternative) would assume some new funding sources as well as the Smart Growth land use scenario and pricing strategies. Staff also encouraged participants to comment more extensively on the structure of the alternatives in the general RTP outreach and in other forums so the group could proceed with its charge to identify performance measures.

Comments/Questions	MTC Staff Response
• MTC customer service projects need to be evaluated. In particular transit operator satisfaction would be an important measure for TransLink¤	• MTC has developed a separate set of measures of effectiveness for these projects. They are reported to the Partnership Planning and Operations Committee as well as individual project oversight committees.
• It would be more informative to run Alternative 3: Other Projects with and without the land use scenario rather than including the land use scenario with the Blueprint Alternative. • It would be best to run the land use scenario separately	• Originally included the land use scenario with the Blueprint Alternative because these are things that MTC does not have the authority to implement. (i.e., MTC can t change land use and can t increase the available funding). The Commission cannot adopt an alternative based on the land use assumptions different from those adopted by ABAG.
• Alternative 2: Maintenance and Operations may not show differences from the others	

4. ISSUES RAISED FOR MOBILITY GOAL

Chuck Purvis from MTC gave a brief presentation on accessibility indicators, highlighting the differences between accessibility indices and isochronal accessibility. The isochronal indicators was used in the equity analysis for the 1998 RTP. David Reinke gave a brief presentation on economic analysis and benefit-cost analysis which has been used in Albany and Seattle. A principle advantage of economic analysis is the potential to compare maintenance, operations, expansion, and supply-side and demand side-strategies. The Group did not have time to review other issues on the agenda, and MTC staff directed the group to review materials in the handouts, which included discussion and specific proposals.

Comments/Questions	MTC Staff Response
• Can surrogates be used for non-work trips with the accessibility measures? • Can all schools be included?	• MTC has looked at using retail jobs (for home based shopping trips) and higher education facilities (for some school trips). Other schools could be included but you must also think about the amount of information you try to present.
• The greatest potential for increasing accessibility is for intra-zonal trips. How are these measured? • It might make more sense to measure accessibility based on distance than on travel time. • Professor Wachs expressed concern at benefit-cost analysis would be less sensitive in a regional plan than in a project evaluation context. • Steve Buckley commented that benefit-cost analysis relies heavily on value assumptions on which there does not appear to be consensus. • Benefit cost analysis might work if you limit the number of things you try to value	• We make assumptions based on accessibility to neighboring zones.

5. ITEMS FOR FOLLOW-UP

- MTC staff will try to find a skilled and knowledgeable facilitator for the next meeting

NEXT MEETINGS

March 21, 2001	April 4, 2001
2:00 — 6:00 PM	2:00 — 5:00 PM (shorter, if possible)
MTC Offices	MTC Offices

MTC PERFORMANCE MEASURES WORKING GROUP
ATTENDANCE AT THE FEBRUARY 27, 2001 MEETING

Janet	Abelson	Albany-El Cerrito Access
Brad	Beck	Contra Costa Transportation Authority
Steve	Beraldo	Rides for Bay Area Commuters
Chris	Brittle	MTC
Mark	Brucker	US EPA (Air 2)
Steve	Buckley	UC Berkeley
Dan	Christians	Solano Transportation Authority
Michael	Cunningham	Bay Area Council
Carolyn	Gonot	Santa Clara Valley Transportation Authority
Steve	Gregory	Port of Oakland
Henry	Hilken	Bay Area Air Quality Management District
John	Holtzclaw	Sierra Club
Lisa	Klein	MTC
Marian	Lee-Skowronek	San Francisco County Transportation Authority
Sherman	Lewis	
Noreen	McDonald	Cambridge Systematics
Dennis	Oliver	California Alliance for Jobs
Chuck	Purvis	MTC
Ezra	Rapport	Senate Select Committee
David	Reinke	BART
David	Schonbrunn	TRANSDEF
Todd	Vogel	US EPA (Air 2)
Prof. Martin	Wachs	Institute of Transportation Studies, University of California
Albert	Yee	Caltrans District 4 Hwy Operations

MTC PERFORMANCE MEASURES WORKING GROUP
MARCH 21, 2001
MEETING SUMMARY

ATTENDANCE —See attached list.

1. SUMMARY OF LAST MEETING
There were no comments on the summary.

2. MEETING OBJECTIVES AND PROCEDURES
MTC staff stated that the primary objective for this meeting is to identify approximately 10 measures that the group can support for use in the 2001 RTP. MTC staff would also like to identify areas for future work for presentation with our recommendation to the Commission. We need to have a recommendation in early April so we can analyze model forecasts and produce a performance report for this RTP. Carolyn Verheyen from Moore Iacofano Goltsman (MIG) will facilitate the next two meetings.

3. DISCUSSION OF CONTINUING WORK PLAN
MTC staff outlined two principle elements of the continuing work plan: 1) refinements to the RTP measures, and 2) development of a complementary program to monitor the existing system. Topic will be addressed in more detail at the next meeting. It is important to show work will continue beyond the 2001 RTP to address a variety of interests.

Comments/Questions	MTC Staff Response
• Participants asked that the following be addressed in the continuing work plan: • Refine the RTP measures, particularly to integrate cost benefit analysis and market pricing. • Address measures related to smart growth (e.g. mode choice and VMT). • Develop objectives by corridor so we know what we are trying to measure. • Develop project-level measures. • Conduct post implementation evaluation of projects. • Monitoring should be based on the refined RTP measures. • Conduct a peer review of MTC s models. • It is a good goal to include cost benefit analysis; we need to retain traditional measures, such as LOS. • Commit to regular meetings	• MTC staff will consider these suggestions in developing the continuing work plan. With regard to model improvements, MTC is willing to consider specific suggestions. We would collect them with suggestions from EJAG and the Air Quality Conformity Task Force and review them all through the Partnership Modeling Coordination Subcommittee.

Comments/Questions	MTC Staff Response
• Members of the group requested an update on the definition of the alternatives and what projects are included in the baseline.	• MTC staff will provide a status report; however, a better forum to comment on these issues is the county and regional RTP outreach process.

4. STATUS REPORT ON EQUITY ANALYSIS

MTC staff introduced the item by noting that the Environmental Justice Advisory Group (EJAG) has been charged to develop the equity analysis. Some but not all elements of the proposed analysis rely on modeling; mapping analyses and financial analyses are also proposed. The lifeline transit network will be one of the mapping elements. The current thought is that we would use the modeling component of the equity analysis in the RTP performance measures.

Comments/Questions	MTC Staff Response
• Has MTC thought about doing accessibility analyses to grocery stores, schools, etc using the models (in addition to the mapping exercise)?	• Many of these trips are intra-zonal, and therefore are better handled by mapping. In addition, the mapping is a good tool to talk to transit operators.

5. DISCUSSION OF SUGGESTED PERFORMANCE MEASURES

MTC staff gave an overview of the memo in the agenda packet. Staff reviewed the following materials received after the packet had already been assembled:

a) David Schonbrunn asked for a comparison between the MTC proposal and a list of sustainable indicators from the Victoria Transport Policy Institute (VTPI). Staff integrated them into the list of other measures for the exercise (Attachment 2).
b) David Schonbrunn and Carolyn Gonot (not present) provided comments in writing and these were distributed.
c) David Reinke proposed an approach to economic analysis that was forwarded to the group by e-mail. MTC staff suggested that differences between MTC s and David s proposed measures be resolved in a separate small group discussion.

Carolyn Verheyen described the exercise. For the proposed measures, she asked each person to indicate whether he or she a) supports the measures as proposed, b) supports it with modifications, or c) does not support it. For the other measures (Attachment 2 from the memo), she asked each person to identify any measures he or she would like to discuss further. The list of other measures was been modified a) to show measures that are either already included in the proposal or that MTC staff feel strongly are not good measures or are not feasible; and b) to include the VTPI sustainability indicators. Participants will be asked to raise their red (disagreement/do not support), yellow (support with qualifications), and green (support) cards at various points in the discussion to document where they stand based on the discussion. The use of the cards does not constitute a formal voting mechanism.

The group conducted the exercise and Carolyn led discussion on each of the proposed measures. (See attached summary of discussion for details — ***Omitted from this version***)–

ACTIONS/OUTCOMES

Mobility

- General support for measures 1 and 2, coupled together and with specific modifications as follows:
  1) Aggregate and average person hours of travel reported separately by mode (auto, transit, walk, bike) for work and non-work trips; the measure would be calculated regionally and within corridors to capture short trips as well as longer trips.
  2) Travel time between select O/D pairs, reported separately by mode (transit, drive alone, carpool, trucks) in the AM peak period. O/D pairs will be selected to reflect changes in travel due to major RTP investments and will include ports, airports, CBDs and major employment centers.
- Support in large part for the proposed accessibility measure:
  3) Accessibility to jobs and shopping opportunities: percent of all regional jobs and retail jobs within 20, 40, 60 minutes by transit and auto (separately), within 20, 40 minutes by bike, and within 20 minutes by walk.

Economic Vitality — discussion deferred to 4/4 due to lack of time.

Community Vitality

- There was very little support for the proposed measure
  6) VMT on arterials — daily
- And little support for any alternatives suggested to date. There was somewhat more support, but still not substantial, for use of the accessibility measure for shopping opportunities within 20 minutes.
- There was consensus in large part to a) agree to address this goal through monitoring, b) give it some more thought before the next meeting, and c) at a minimum, include a discussion in the recommended measures and performance report of the goal and the difficulty measuring it for the RTP.

Equity — The group made the following recommendations to EJAG:

8) Average number of jobs within 20, 40, 60 minutes by auto, carpool, transit
   - Measure should be consistent with #3 and should refer to percent of regional jobs .
9) Average travel time for work trips from target communities
   - None
10) Transit access from target zones to major job centers
   - Clarify that transit access will be measured as door to door travel time.
   - After some discussion, the group generally agreed that the list of job centers here should be consistent with those in measure #4.

Economic efficiency — a small group will meet to reconcile different proposals.

ITEMS FOR FOLLOW-UP

- A small group will meet before the next meeting to discuss differences between MTC s and David Reinke s proposed measures of economic efficiency. Volunteers included Sherman Lewis, Ezra Rapport, Mark Brucker, David Reinke, Martin Wachs, Lisa Klein, and Chris Brittle.
- MTC staff will incorporate a discussion of VTA mobility measure person trips in the peak period , as requested in a previous meeting. (This measure has also been proposed for testing.)
- Give more thought to community vitality, as none of the proposed measures was broadly accepted.
- MTC staff will provide a status report on the RTP alternatives and definition of the baseline.
- The group will discuss measures for economic vitality at next meeting.

NEXT MEETING

April 4, 2001
2:00 — 5:00 PM
MTC Offices, Room 171
101 8th Street, Oakland

MTC PERFORMANCE MEASURES WORKING GROUP
ATTENDANCE AT THE MARCH 21, 2001 MEETING

Brad	Beck	Contra Costa Transportation Authority
Steve	Beraldo	Rides for Bay Area Commuters
Chris	Brittle	MTC
Mark	Brucker	US EPA (Air 2)
Steve	Buckley	UC Berkeley
Lisa	Carboni	Caltrans
Dan	Christians	Solano Transportation Authority
Corrine	Goodrich	SamTrans/JPB
Steve	Gregory	Port of Oakland
Jean	Hart	Alameda County CMA
Henry	Hilken	Bay Area Air Quality Management District
John	Holtzclaw	Sierra Club
Lisa	Klein	MTC
Marian	Lee-Skowronek	San Francisco County Transportation Authority
Trent	Lethco	MTC
Sherman	Lewis	
Noreen	McDonald	Cambridge Systematics
Dennis	Oliver	California Alliance for Jobs
Chuck	Purvis	MTC
Ezra	Rapport	Senate Select Committee
David	Reinke	BART
Todd	Vogel	US EPA (Air 2)
Professor Marty	Wachs	Institute of Transportation Studies, University of California

MTC PERFORMANCE MEASURES WORKING GROUP
APRIL 4, 2001 - REVISED
MEETING SUMMARY

ATTENDANCE —See attached list.

1. SUMMARY OF LAST MEETING

Comments/Questions	MTC Staff Response
• Clarification offered re the comment about VMT in the detailed summary under Environmental Quality: VMT may be better because it better measures MTC s contribution .	• The minutes will be changed to reflect this statement.
• Request for clarification on measure #1 under mobility: is it average or aggregate travel time.	• Both average and aggregate would be reported.
• Requests to revisit #1 to a) consider median and 90th percentile instead of average and b) to understand the measure better.	• Agree to revisit #1.

2. MEETING OBJECTIVES AND PROCEDURES

Carolyn Verheyen from MIG stated that the primary objectives for the meeting are to develop agreement on measures for the remaining RTP goals, working from MTC s proposal and the positions recorded on March 21 for each proposed measure, and to review other measures of interest. As time allows, we the group can discuss ideas for future work. Participants will be asked to raise their red (disagreement/do not support), yellow (support with qualifications), and green (support) cards at various points in the discussion to document where they stand based on the discussion. The use of the cards does not constitute a formal voting mechanism. We are aiming for general support rather than consensus.

3. DISCUSSION OF SUGGESTED PERFORMANCE MEASURES

The group discussed the two proposed measures (#4 and #5) under Economic Vitality and ultimately expressed general support to at least test #4 and to drop #5. The group reviewed the outcome of the small group meeting on the economic efficiency measure (#11), proposed for inclusion under the Economic Vitality Goal, and expressed general support to at least test it. The group revisited selected measures under Mobility (#1 and #3) and endorsed modifications. Members of the group proposed a new measure for consideration under Community Vitality; however, the group did not generally support the proposal. See Actions/Outcomes and the detailed summary sheets for more discussion of the specific measures. ***— Detailed Summary omitted from this version —***

Comments/Questions	MTC Staff Response
• The equity measures be identical to comparable mobility and economic vitality measures	• Staff will coordinate recommendations by the two groups so they are consistent.
• Some of the other indicators of interest to this group should be included in the performance report as well as the RTP EIR.	• One objective in selecting 10 measures for the report was to focus attention on a small number of measures. Not sure we achieve this goal by including a lot of other measures in the performance report. We can decide this at a later point

ACTIONS/OUTCOMES (Based on discussions on 3/21 and 4/4)

Mobility	Status
1. Aggregate, median, and 90th percentile travel time reported separately by primary travel mode (drive alone, carpool, transit, walk, and bike) for: – Work trips (person hours) – Non work trips (person hours) – Truck trips (vehicle hours) For example, the total travel time for a trip with walk access to transit would be reflected under transit. Calculated for the region and by corridor to capture short trips. Mode share or number of trips by mode would be reported with this measure as an explanatory factor.	General support on 4/4 to revise the measure as shown from version accepted on 3/21.
2. Travel time for select O/D pairs reported separately by mode for drive alone, carpool, transit, trucks (AM peak) O/D pairs selected by corridor to show impacts of major RTP investments; include ports, airports, CBDs and major employment sites	General support for measure in combination with #1. (Unchanged from 3/21.)
3. Accessibility to jobs and shopping opportunities Percent of all regional jobs (reported separately by mode) within X minutes X = 30, 60 minutes for auto and transit X = 15, 30 minutes for walk and bike – Look at a threshold for retail jobs (proxy for shopping)	General support on 4/4 for changes as shown from version accepted on 3/21

	Status
Economic Vitality	
4. Accessibility of employers to the region's workforce Percent of regional workforce within X minutes of select job centers (TBD) X = 30, 60 minutes by drive alone, carpool, transit X = 15,30 minutes by walk, bike	General support to at least test the measures as shown. (revised from original proposal) Mixed support to include as 1 of the 10 measures
	General support to drop this measure.
11. Economic efficiency – defined as one of the following depending on computation complexity: a) net benefit = present value(travel time savings) – present value(costs) b) benefit cost ratio = (value of travel time savings)/(annualized costs) Costs will include direct user costs (auto operating costs and transit fares) and public investments (lifecycle capital and operating costs) in projects that impact travel time in the model. Changes in travel time and costs will be calculated from the base case (no project alternative).	General support to test measure including valuation of safety and air quality (PM_{10}) and include a full discussion of the difficulties in measuring and valuing them. Mixed support for including under Economic Vitality as one of the 10 measures.
See also #1 and #2: aggregate travel time and O/D travel time for trucks	Not discussed by group.

Community Vitality

On the whole, the group felt none of the proposed measures or other suggestions on 3/21 or 4/4 adequately captured the concept of Community Vitality. As a result, staff will not recommend a performance measure for this goal; however, the recommendation will include a discussion of the importance of this goal, the difficulty in measuring in it the RTP context, and the desire that be addressed through the performance monitoring program in the future.

Environmental Quality	
6. Emissions: – ROG and NOx emissions (tons per day over/under transportation budget) – PM10 emissions (tons per day) from vehicles, entrained road dust – CO2 emissions (tons per day) from transit, autos/trucks (surrogate for global warming)	Supported as proposed. (Unchanged from 3/21.)
Equity [proposed by EJAG]	
7. Percent of all regional jobs with 30, 60 minutes of home by drive alone, carpool and transit from target communities and by income group (includes peak and off-peak)	Suggestion to EJAG: make consistent with #3 (as revised on 4/4)
8. Average travel time for peak and off-peak work trips from the target communities	Suggestion to EJAG: none. (Unchanged from 3/21.)
9. Transit access from target communities to select job centers (SF, Oakland, San Jose, Tri-Valley, Walnut Creek/Concord, and Santa Rosa)	Suggestion to EJAG: make list of job centers consistent with #4 (as revised on 4/4)

ITEMS FOR FOLLOW-UP

- Clarify how the accessibility measures for mobility and economic vitality would be calculated.
- Develop a list of key points to include in the discussion of Community Vitality, its importance as an RTP goal, and the difficulty of measuring it in the RTP context.

NEXT MEETING

April 25, 2001
3:00 — 5:00 PM
MTC Offices, 3rd Floor Conference Room

101 8th Street, Oakland

MTC PERFORMANCE MEASURES WORKING GROUP

ATTENDANCE AT THE APRIL 4, 2001 MEETING

Janet	Abelson	Albany-El Cerrito Access
Brad	Beck	Contra Costa Transportation Authority
Steve	Beraldo	Rides for Bay Area Commuters
Chris	Brittle	MTC
Lisa	Carboni	Caltrans
Dan	Christians	Solano Transportation Authority
Michael	Cunningham	Bay Area Council
Margurite	Fuller	San Francisco MUNI
Carolyn	Gonot	Santa Clara Valley Transportation Authority
Steve	Gregory	Port of Oakland
Henry	Hilken	Bay Area Air Quality Management District
John	Holtzclaw	Sierra Club
Lisa	Klein	MTC
Tina	Konvalinka	AC Transit
Marian	Lee-Skowronek	San Francisco County Transportation Authority
Sherman	Lewis	
Noreen	McDonald	Cambridge Systematics
Dennis	Oliver	California Alliance for Jobs
Ezra	Rapport	Senate Select Committee
David	Reinke	BART
David	Schonbrunn	TRANSDEF
Ethan	Veneklasen	California Alliance for Jobs
Carolyn	Verheyen	MIG
Todd	Vogel	US EPA (Air 2)
Martin	Wachs	Institute of Transportation Studies, University of California

MTC PERFORMANCE MEASURES WORKING GROUP
APRIL 25, 2001
MEETING SUMMARY

ATTENDANCE —See attached list.

1. SUMMARY OF LAST MEETING

Comments/Questions	MTC Staff Response
• Under Community Vitality, the summary should be amended to reflect the group s with that the recommendation include a discussion of the importance of the goal, and the importance of developing a means to measure community vitality in the future through monitoring.	• The summary will be edited to reflect these changes.

2. MEETING OBJECTIVES

MTC staff stated that the objectives for the meeting were to review the recommendation that will go to the Commission in May, explain any adjustments from where the group left off on April 4, and wrap up discussion on selected topics including the accessibility measure, other measures of interest, and the continuing work plan.

3. STATUS REPORTS

MTC staff gave an overview the three principal elements of the of the proposed equity analysis: (1) a mapping exercise to show the relationship between transit and activity centers; (2) a modeling exercise consistent with the other performance measures; and (3) a funding analysis. The Environmental Justice Advisory Group (EJAG) has reached tentative agreement on the demographic profile for the modeling exercise but more discussion is needed on the three proposed measures. MTC staff gave an overview of developments related performance measures in the Regional Agencies Smart Growth project. The project will use predictors to evaluate alternative land use scenarios for each of the counties. They anticipate using the same measure we are recommending for air quality; however, they are discussing using person-miles of travel and mode share rather than the RTP performance measures.

4. CLARIFICATION OF ACCESSIBILITY MEASURES

Due to confusion at the last meeting, MTC staff reported back to the group with a clarification on the accessibility measure. The measures is a weighted average of the number of percent of jobs accessible within the given travel time contour (e.g. 15 minutes) for each zone. The average is weighted by households because not all zones are comparable.

Comments/Questions	MTC Staff Response
• Would it be better to use the median than the average?	• It is not clear that a median would be meaningful or different from the average.
• We are not likely to see changes among alternatives in the regional number.	• MTC would likely do some mapping of the different alternatives to compare them. The idea of looking at subareas (e.g. superdistricts or counties) seems interesting. We may wish to explore that when it comes down to calculating the measure.
• Does the measures address the need for more jobs where there are more people?	• Yes, in so far as the measures is weighted by households.
• For several measures, MTC may have to see the results and then decide how to most meaningfully report them.	
• It is not clear what we are trying to get at with accessibility. Without objectives by corridor, we cannot target our measures. The alternatives are so similar that our measures will not show differences and decision makers will not see the value of using performance measures.	

5. RECOMMENDATION FOR THE 2001 RTP

MTC staff gave an overview of the draft memo containing staff recommendations to the MTC Planning and Operations Committee (POC). Staff described several adjustments (outlined in the meeting packet) from where the group left off on April 4. The adjustments were made after consideration of technical feasibility and staff work load. The group spent some time discussing the appropriate travel time thresholds for the accessibility measures under Mobility, Economic Vitality, and Equity. The general sense was that 30 minutes was too high for the lower threshold, because it is longer than the average travel time, and 60 minutes is too high for the higher threshold, because it represents a really long trip. We might do better to approximately half below and half above the average travel time. The group discussed 12.5/25/50, 15/30/45, and 20/40/60 minute thresholds for transit and auto trips. There was also substantial about the nature of shopping trips and that many such trips are shorter than work trips. MTC staff also reviewed the measures proposed for testing. MTC staff directed the group s attention to the list of other measures of interest that received 5 or more votes at the April 4 meeting. In the interest of time and desire to move on to the work plan, the group did not discuss this topic. The group offered several comments on the continuing work plan.

Comments/Questions	MTC Staff Response
• May need further explanation of the relevance of measures to RTP decisions.	• We will address this and other suggested edits in the final version.
• Recommend a shorter memo that is more of an advocacy piece. It would talk about the importance of performance measures in the RTP and the need for monitoring.	

Comments/Questions	MTC Staff Response
• The potential value of performance measures does not come across. It is shortsighted not to mention the great future potential. • Many jurisdictions have not signed on to a full program of performance measures and are hesitant or suspicious, particularly of potential project evaluation. There remain issues about how the measures are used that still need to be resolved. • The memo should reflect both the excitement, interest and skepticism about performance measures. • SFTA is in support of performance measurement. We see this RTP as a test phase, given that we don t know how well the measures will work.	
• Will the data be available to others?	• MTC will make it available in Excel files that can be downloaded from our web site.
• Regarding travel time thresholds for accessibility, round numbers such as 15, 20, 30, etc. will be more useful for the public.	• MTC staff agree.
• Please clarify why the net benefit measure does not appear in the recommendation. It should be clear that the benefit cost ratio is merely a placeholder until we can do the net benefit measure.	• We will not be able to include the net benefit measure in the performance report in August because we will not have mid-year (2010 and 2020) travel forecasts until the fall; the mid-year forecasts are necessary to estimate the benefits stream for the net benefit calculation.
• The benefit cost and net benefit measures are meaningless unless they account for latent demand, induced demand, and delay due to construction. • We should be especially thorough in the discussion of limitation of the economic efficiency measure because it is a bottom line type of measure.	• MTC staff are aware that some participants hold this perspective. MTC staff decided to include the measures despite mixed support from the working group. We will include a discussion of these and other limitations of the measure in the report.
• We should include accident and pollution costs in the net benefit measure	• As discussed previously, MTC would provide model output information to members of the group who wish to do these calculations.

Comments/Questions	MTC Staff Response
• In the air quality measure, NOx and ROG should be measured as total tons per day (rather than tons over or under conformity budgets).	• It is significant that these pollutants are decreasing and will be far below the conformity budget in 2025. If we are far below the budget, do we have a problem? We will report total tons per day and include the budget as a footnote.
• Re person trips in the peak period, it is not clear whether we trying to measure capacity expansion or efficiency.	• This is a measure of throughput that assumes a more efficient system will move more people in the peak period.
• How do the measures address the needs of an aging population that won t be able to drive? • The most common way to travel for those used to drive is to be driven by someone else.	• The performance report will look indirectly at the needs of the aging population; however, this is really a larger planning issue.
• Pricing measures are needed to address the pricing things correctly.	• This has been raised a number of times, and while not included on the list of other measures, has not generated a lot of support within the group.

Specific comments about the continuing work plan:

Comments/Questions	MTC Staff Response
• Address the need for goals and objectives. What does it mean where the memo says that MTC is still evaluating this? • Include an analysis of transportation-related problems (regional and corridor). This should include a problem hypothesis. • Address the need for objectives for each corridor. • Address global warming.	
• We should be talking about the agenda for future work in greater detail. We should schedule regular meetings. • We should meet again after the Commission reviews the recommendation to find out what happened and to continue discussion on continuing work. • Next meeting could be a scoping session.	• The future meeting schedule needs more discussion. We are hesitant to commit to a series of regular meetings to discuss future work prior to completion of the RTP. This is simply a limitation of staff resources.

ACTIONS/OUTCOMES

- MTC staff will revise the memo to reflect the comments above. In particular, the memo will be revised to include more of an advocacy tone and to convey more about the long term benefits of performance measures and the spirit of the group. Those with additional, specific edits should forward them to Lisa Klein by noon on Friday, April 27.
- MTC staff will revise the travel time thresholds for the accessibility measures under Mobility, Economic Vitality, and Equity so that the lowest threshold is shorter than the average travel time. Staff will likely choose between 15/30/45 and 20/40/60.
- The performance report will list the total emissions for ROG and NOx along with the transportation budget and the tons per day above/below the budget.
- We will schedule a meeting for late May or early June to review Commission reaction to the recommendation and to continue discussion on the continuing work plan.

6. NEXT STEPS AND ITEMS FOR FOLLOW-UP

- MTC staff will revise the recommendation to POC in accordance with suggestions.
- MTC staff will check availability by e-mail for possible meeting dates in late May or early June.
- MTC staff will work on a detailed document to summarize the process. The document will include a more in-depth discussion of key issues covered by the group.

NEXT MEETING

Wednesday, June 6, 2001
3:00 — 5:00 PM
Claremont Conference Room, MTC s Harrison Street Offices
1999 Harrison Street, Suite 1700, Oakland

MTC PERFORMANCE MEASURES WORKING GROUP
ATTENDANCE AT THE APRIL 25, 2001 MEETING

Janet	Abelson	Albany-El Cerrito Access
Brad	Beck	Contra Costa Transportation Authority
Chris	Brittle	MTC
Mark	Brucker	US EPA (Air 2)
Steve	Buckley	UC Berkeley
Lisa	Carboni	Caltrans
Patrick	Duffey	ABAG
Henry	Hilken	Bay Area Air Quality Management District
Lisa	Klein	MTC
Tina	Konvalinka	AC Transit
Marian	Lee-Skowronek	San Francisco County Transportation Authority
Trent	Lethco	MTC
Noreen	McDonald	Cambridge Systematics
Chuck	Purvis	MTC
Ezra	Rapport	Senate Select Committee
David	Reinke	BART
David	Schonbrunn	TRANSDEF
Marty	Wachs	Institute of Transportation Studies, UC Berkeley